WINDBREAK/SHELTERBELT RENOVATION (FEET)

CODE 650

MONTANA TECHNICAL GUIDE **SECTION IV**

DEFINITION

Widening, partial replanting, releasing, removing and replacing selected trees and shrubs to improve an existing windbreak or shelterbelt.

PURPOSES

- Restoring or enhancing the function of existing windbreaks or shelterbelts.
- **To invigorate the remaining trees/shrubs by removing stress factors.**
- **To remove dead, dying, or diseased trees/shrubs to control density, reduce overcrowding, and improve windbreak/shelterbelt effectiveness.**
- **To improve snow deposition patterns.**

CONDITIONS WHERE PRACTICE APPLIES

The condition where this practice applies is in any windbreak or shelterbelt that is no longer functioning properly for the intended purpose.

This may occur due to using short-lived species, competing vegetation, overcrowding, insect and disease, livestock damage, herbicide damage, and/or drought.

CRITERIA

Evaluate the windbreak/shelterbelt to determine why it is not functioning as intended. A key to windbreak renovation needs based on observed symptoms is attached to this standard. The key identifies renovation methods to consider after symptoms have been identified.

The following criteria will be used individually or in combination to accomplish windbreak or shelterbelt renovation:

- To reduce plant competition or alter the density of the planting, individual trees or shrubs will be identified for thinning.
- To remove diseased **and damaged** branches or alter the density of the planting, pruning of trees will be used.
- To release adjacent rows of trees or shrubs, entire or partial rows of trees or shrubs will be identified for removal.
- To improve density and vigor of identified rows of trees or shrubs in decline, trees or shrubs will be cut to the ground to allow sprouting (coppice).
- To improve the growth and vigor of trees and shrubs, competing herbaceous vegetation will be mechanically or chemically controlled.
- To improve windbreak/shelterbelt density, additional rows of trees or shrubs will be added adjacent to or within an existing windbreak/ shelterbelt. **(See Field Office Technical Guide (FOTG), Section IV, Practice Standards and Specifications, 380–Windbreak/Shelterbelt Establishment.)**

Residual plants will be protected during the renovation.

Comply with applicable laws and regulations, including the state's Best Management Practices (BMPs).

Renovation may include a combination of actions to restore or create the proper spacing, density, or structure in a windbreak/shelterbelt. The following restoration methods will be used to enhance windbreak/shelterbelts:

NOTE: This type of font **(AaBbCcDdEe 123..)** indicates NRCS National Standards.
This type of font (AaBbCcDdEe 123..) indicates Montana Supplement.

1. **Release of Sod Bound Trees and Shrubs**

Control competing vegetation by the use of tillage or chemicals in established windbreaks. This will improve their growth and vigor. Older trees/shrubs that have been stressed for a long period of time may not release as quickly.

This can be applied when at least 70 percent of the trees are alive and capable of responding.

Cultivate no deeper than three inches between the rows and no closer than two feet from the base of the plant. The optimum time to perform this activity is from mid-summer to early fall.

For chemical release, consult the county extension agent or a chemical representative for specific information regarding kind of herbicide and its proper uses. Read and follow all label directions. Dispose of unused material or empty containers according to laws and regulations.

Control competing vegetation, annually or when needed.

2. **Thinning, Pruning, and Coppicing**

THINNING

Thinning is the removal of selected plants or rows to:

- **allow more growing space, moisture, nutrients, and light for the remaining plants;**
- **control insect/disease infestations;**
- **provide space for windbreak maintenance.**

Leave plants that: are not damaged, have the most vigor, are long-lived species, will respond to release, and will perform the desired function of the windbreak.

Remove stumps that will interfere with cultivation. Kill resprouting on remaining stumps with an appropriate herbicide unless the sprouting is desired.

Dispose of woody debris in a manner that minimizes insect and disease problems.

PRUNING

Pruning is the removal of dead or live branches. Used to correct storm damage, remove double leaders, insect or disease damaged limbs, or to alter snow distribution.

Remove branches that interfere with cultivation equipment and the normal growth of adjacent trees.

Remove no more than 50 percent of a tree live crown.

Refer to FOTG, Section IV, Practice Standards and Specifications, 660–Tree/Shrub Pruning for guidance.

COPPICING

Coppicing is the re-growth of trees and shrubs from root and/or stump sprouts. Almost all shrubs and many deciduous trees will re-sprout from live stumps.

Sprouting/coppicing will improve ground level density and vigor.

Cut during the dormant season from winter to early spring.

Cut trees and shrubs to within four to eight inches above the ground for stump sprouts.

Deciduous tree limbs may be trimmed to allow coppice/sprouting from those limbs to improve density and vigor of the tree.

3. **Enhancement Plantings**

Enhancement planting is the planting of additional trees or shrubs to improve density.

There are two types of enhancement plantings:

Interplanting and Underplanting.

INTERPLANTING

Interplantings are plantings adjacent to an existing windbreak/shelterbelt.

Supplemental row plantings will not be planted closer than 20 feet to an existing row unless the renovation plan includes the eventual removal of the adjacent row prior to it suppressing the newly planted row.

The row being planted next to an existing tree row should be shade tolerant. There should not be any limitations if the interplanting is for an outside row.

UNDERPLANTING

Underplantings are plantings within an existing windbreak.

This method fills gaps created by the death of interior trees or shrubs.

The species planted should be able to handle competition from existing trees and shrubs for light, moisture, and still respond with adequate growth. See list of suitable plants below.

Hand scalping should be limited to sites where mechanical site preparation is not possible.

Avoid scalping in sod sites unless the grass has been controlled chemically.

Scalped sites should be a minimum of three feet in diameter.

INTERPLANTING AND UNDERPLANTING

Planting requires:

- **Using species adapted to the soil properties and the site conditions. (See FOTG, Section II, Conservation Tree/Shrub Suitability Groups.)**
- **Using acceptable stock. (See FOTG, Section IV, Practice Standards and Specifications, 380–Windbreak/ Shelterbelt Establishment.)**
- **Having sites properly prepared for planting. (See FOTG, Section IV, Practice Standards and Specifications, 380–Windbreak/Shelterbelt Establishment.)**
- **Using appropriate planting methods. (See FOTG, Section IV, Practice Standards and Specifications, 380–Windbreak/Shelterbelt Establishment.)**

Avoid mechanical wounding of the residual plants while renovating.

Control competing vegetation.

Species suited for underplantings or interplantings are:

Shrubs

Common chokecherry, Peking and 'Centennial' cotoneaster, golden currant, red-osier dogwood, blueleaf honeysuckle, caragana, and woods rose.

Deciduous Trees

Green ash, Siberian elm, common hackberry, Bur oak, and Russian olive.

Evergreen Trees

Colorado blue spruce, Black Hills spruce, Rocky Mountain juniper, Eastern redcedar, and Douglas-fir.

4. **Row Removal**

Row removal is the complete removal of a tree or shrub row to allow rows of new trees or shrubs to be planted.

Remove tree/shrub roots and stumps from the row if they interfere with the planting and maintenance operations.

Remove all woody debris from the site and dispose of it properly to minimize insect and disease problems.

Burning of woody material shall be done in compliance with local and state regulations.

Avoid mechanical wounding of the residual plants while renovating.

For single row windbreaks:

- **Plant a new row and allow for the planting to become an effective barrier prior to removal of existing row.**

5. **Natural Regeneration**

Older plantings may have trees and shrubs naturally reproducing under the main canopy. Renovation plans can be designed to release this new growth.

Manage the natural reproduction utilizing the same principles as timber stand improvement. Selectively thin (remove) undesired species

and/or plants to attain the desired windbreak composition and density.

6. **Root Pruning**

Root pruning is the act of severing tree roots.

Root pruning is used to reduce the competition on adjacent cropland areas from trees and to reduce herbicide damage to trees from soil applied herbicides.

Root pruning can be used to reduce adverse competition between existing windbreaks and newly established supplemental plantings.

Root prune by pulling a vertical blade or plow through the soil at a depth of 18 to 30 inches no closer than the canopy drip line. Only one side of any row shall be root pruned per year.

Repeat every 5 to 10 years if necessary.

Locate all buried utility lines prior to root pruning.

CONSIDERATIONS

Renovation may be accomplished over a period of years.

Consider allowing enough space for plants to grow and for cultivation equipment.

Debris should be removed from the site and disposed properly if the debris will cause insect, disease, fire, or operability problems.

Elm trees should be burned or debarked to prevent creating habitat for the insect that spreads Dutch Elm Disease.

Consider the use of mechanical chipper/mulchers for effective disposal of branches/limbs and creating a usable mulch product.

Consider the current condition of the plants and their ability to respond to improved growing conditions. Some short-lived species are generally not worth renovation depending on their age and condition. (i.e., Siberian elm, sand and nanking cherry.)

Consider shade tolerance when selecting species for replanting within or adjacent to an existing windbreak or shelterbelt.

Consider the longevity and desirability of the species involved.

Wildlife needs should be considered when selecting tree or shrub species. **Consider leaving some snags, down logs, and brush piles for wildlife.**

Avoid plants that may be alternate hosts to undesirable pests.

PLANS AND SPECIFICATIONS

Specifications for applying this practice shall be prepared for each site and recorded using approved specification sheets, job sheets, technical notes, and narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

Windbreak/shelterbelt renovation is part of windbreak/shelterbelt maintenance program.

The following actions shall be carried out to insure that this practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance):

- Vegetative competition will be controlled as long as it inhibits the renewed growth and vigor of the windbreak or shelterbelt.
- Supplemental water will be provided as needed.
- Trees and shrubs will be inspected periodically and protected from adverse impacts including insects, diseases or competing vegetation. The trees and shrubs will also be protected from fire and damage from livestock or wildlife.
- Additional thinning, pruning, or coppice management may be needed in the future to maintain function.
- Periodic applications of nutrients may be needed to maintain plant vigor.

Livestock and destructive wildlife populations shall be controlled or excluded as necessary to achieve and maintain the intended purpose. Refer to FOTG, Section IV, Practice Standards and Specifications, 382–Fencing for guidance.

KEY 1. TO WINDBREAK RENOVATION NEEDS BASED ON OBSERVED SYMPTONS

CONDITION A:

The windbreak trees appear healthy, vigorous, full, and straight with few or no dead branches, and no insect or disease problems. The trees are well spaced within rows and between rows, with branch tips in the crown not significantly touching or overlapping adjacent trees. There is a good mix of deciduous and coniferous trees and shrub species. No aggressive sods or noxious weeds are established within the windbreak. At least two distinct age classes of plants are present.

CONSIDER RENOVATION METHODS: 1, 16.

CONDITION B:

The windbreak trees appear healthy, vigorous, full and straight with few or no dead branches, and no insect or disease problems. The trees are well spaced within and between rows with branch tips in the crowns not significantly touching or overlapping adjacent trees. No aggressive weeds or noxious weeds are established within the windbreak. Trees are all the approximate same age.

CONSIDER RENOVATION METHODS: 2, 3, 16.

CONDITION C:

The windbreak trees appear unhealthy, slow-growing, skimpy, poorly formed, with many dead branches and extensive insect and disease problems.

CONSIDER RENOVATION METHODS: 3, 4, 5, 7, 9, 10.

CONDITION D:

The windbreak trees are overcrowded within rows, with extensive interlacing of branches in the crowns of adjacent trees. Tree rows are too close together, with overtopping causing significant growth suppression of slower growing species.

CONSIDER RENOVATION METHODS: 11, 12, 17.

CONDITION E:

Outer row of a multiple row windbreak is thin and leggy and is allowing snow to blow through to areas needing protection.

CONSIDER RENOVATION METHODS: 3, 6, 12, 13.

CONDITION F:

Windbreak is composed of only one species.

CONSIDER RENOVATION METHODS: 2, 6.

CONDITION G:

Single row field windbreak is mostly alive but losing effectiveness.

CONSIDER RENOVATION METHODS: 3, 4, 10, 12, 14, 16.

CONDITION H:

Single row field windbreak is mostly dead.

CONSIDER RENOVATION METHODS: 4, 9, 10, 14, 15.

CONDITION I:

Windbreak is mostly tall trees that appear healthy. Lower and midlevel limbs are dead or missing. Protection provided is less than 10-20 years earlier.

CONSIDER RENOVATION METHODS: 3, 6, 7, 13.

CONDITION J:

Newly planted tree rows adjacent to existing windbreak rows are doing poorly.

CONSIDER RENOVATION METHODS: 4, 8, 9, 10, 17.

KEY 2. RENOVATION METHODS FOR CONSIDERATION AFTER SYMPTOM IDENTIFICATION

1. No renovation needed. Continue yearly maintenance.
2. Interplant deciduous trees or conifers to increase species diversity.
3. Add additional row(s) of trees or shrubs to establish or maintain age class diversity.
4. Use approved herbicides or shallow tillage to remove competing sods and noxious weeds.
5. Prune diseased, insect infested, and dead limbs. Thin diseased and dead trees.
6. Intraplant junipers or shade tolerant shrubs to increase lower level density.
7. Prevent livestock access to windbreak.
8. Root prune at dripline of adjacent mature tree row.
9. Check adaptability of species to the specific soils at the windbreak site.
10. Check for misapplications of damaging herbicides on adjacent lawns or fields.
11. Remove overtopped species. Allow more room between species of dissimilar growth habits.
12. Cleanly remove top growth and allow stumps to coppice—sprout back.
13. Interplant another row of conifers or dense shrubs.
14. Establish or maintain different species in adjacent single row field windbreaks.
15. Remove old row. Plant and maintain adapted species.
16. Consider and plan for future renovation needs.
17. Replant new tree or shrub rows at the proper distance from existing trees.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.